



Forest Health Protection Pacific Southwest Region



Date: November 30, 2018

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To: Patricia Grantham, Forest Supervisor, Klamath National Forest

Subject: Travis Coughlin Silvicultural Certification Stand in South End Project

At the request of Travis Coughlin, a site visit was made to the Blue Canyon area, Klamath National Forest, on July 19, 2018. The objectives were to assess the current insect and disease conditions and discuss treatment options in stand 729-27, for his silvicultural certification.

Background

Stand 729-27 is 70 acres located in Blue Canyon between the 43N11 and the 44N21 roads (T43N, R2W, sections 11, 12, and 14), at about 5,200 feet elevation in the Butte Creek watershed. The stand is composed of four strata: 22.5 acres of managed forest, 25.2 acres of unmanaged forest, and 13.4 acres of meadow with an 8.6 acre buffer. The

stand was originally placed into the 3-Springs NEPA but has since been moved to the South End Project. This field assessment is strictly for the 70 acres visited (Figure 1).

The land allocation is General Forest – Matrix and is managed for forest health and timber value. There are three zones within the stand: Riparian, Meadow, and Timber. All ponderosa pine timber over 12 inches DBH was logged in the 1910's for the railroad, all other species were left behind. The managed timber strata was last thinned in the early 2000's. There are photos of the areas available circa 1944. These photos show a much larger meadow area than is currently present. There is no aspen present in the meadow, only grass being invaded by white fir.

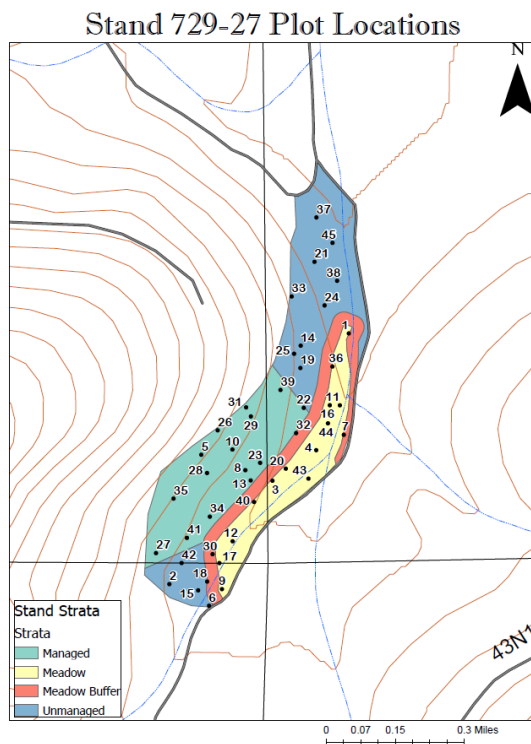


Figure 1. Map of strata within stand 729-27.

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Observations

The stand is mixed conifer with ponderosa pine (*Pinus ponderosa*), white fir (*Abies concolor*), and lesser amounts of incense cedar (*Calocedrus decurrens*), sugar pine (*P. lambertiana*), and lodgepole pine (*P. contorta*). Ponderosa pine dominated the managed and unmanaged timber strata and white fir dominated the meadow and buffer strata with heavy ingrowth in the timber. Stand Density Index averaged 280 for the stand with a low of 225 in the managed strata and a high of 335 in the meadow buffer. Average diameter was 8.2 inches.

Lodgepole pine made up a small portion of the stand in and around the meadow area. These trees were all over 12 inches in diameter and thought to have been left by the original timber removal in 1944. Many had broken out tops and old bear wounds, some infested with sequoia pitch moth (*Synanthedon sequoia*).

Forest Health Protection was called to discuss the noted white fir mortality occurring in the stand. White fir mortality was found throughout the stand especially in the riparian zones and scattered through the timber in both managed and unmanaged strata (Figure 2).



Figure 2. White fir mortality through the timber strata and across the meadow buffer.

Heterobasidion root disease, caused by the pathogen *Heterobasidion occidentale*, was confirmed by the presence of fruiting bodies (conks) in white fir stumps near a riparian zone (Figure3). Other areas with laminate decay associated with dead/dying white fir are considered guilty by association once the pathogen is confirmed in a stand. Fir engraver, *Scolytus ventralis*, galleries were also found. Fir engraver is common in stressed true fir forests. There were patches of white fir with dwarf mistletoe infestations in the meadow buffer (Figure 4).



Figure 3. *Heterobasidion occidentale* fruiting body on white fir.



Figure 4. Dwarf mistletoe on white fir.

A small patch of dead ponderosa pine were found at the edge of the road where western pine beetle, *Dendroctonus brevicomis*, was found to be the cause (Figure 5). There was also evidence of red turpentine beetle (*D. valens*) and ambrosia beetles at same. Witches brooms formed from *Elytroderma* infection were found in ponderosa pine in the meadow buffer.



Figure 5. Western pine beetle galleries under the bark of dead ponderosa pine.

Discussion

Discussions in the field centered on two divisions: meadow restoration by pulling all tree species back from the riparian area to the slope and forest thinning to reduce stocking and improve overall forest health. The photos from the earlier railroad logging showed that the original meadow area was much larger than it is currently. Removing the encroaching white fir from the riparian area up to the slope would increase the meadow size and improve flow of the streams. This would increase habitat diversity for wildlife.

Forest thinning would concentrate on removing white fir which is susceptible to, and likely infected with the *Heterobasidion* pathogen which is present throughout the stand. Removing white fir would decrease tree density and increase species diversity in the meadow buffer allowing the remaining tree species to grow larger. Removing white fir may decrease species diversity on the timber strata, but the *Heterobasidion* root disease would prevent the white fir from creating a sustainable forest. Pine species are not susceptible to the *H. occidentale* pathogen and, combined with the incense cedar, would create a healthy forest while the pathogen continues to infect white fir as it seeds back into the stand.. The Forest Plan describes the allocation of Matrix to be managed for forest health and timber value.

Although western pine beetle is present in the stand, it is currently acting as a “normal” disturbance agent creating gaps where the host is stressed. Thinning is an effective means of increasing the resiliency of pine dominated forests to western pine beetle infestations and other disturbances, such as wildfire. Trees utilize growth factors such as water, nutrients, and sunlight until one or more become limiting. It is then that trees become susceptible. Disturbances can make growing space available.

If you have any questions regarding this report and/or need additional information, please contact Cynthia Snyder at 530-226-2437.

/s/ Cynthia Snyder

CC: Travis Coughlin, Andrew Mueller, Chris Losi, Sheri Smith, Phil Cannon, Sherry Hazlehurst, Chris Fischer